

We claim:

JC20 Rec'd PCT/PTO 29 SEP 2005

1. A system which is suitable as a catalyst for the hydrocyanation of olefinically
5 unsaturated compounds and comprises
- a) Ni(0)
- b) a compound which complexes Ni(0) as a ligand and comprises phosphites,
10 phosphonites or mixtures thereof,
- c) a Lewis acid
- and
- 15 d) a compound of the formula $M R_n$
- c) and d) being different,
- 20 where
- M: Al or Ti
- R: identical or different monovalent alkoxy radicals, in which case a plurality of
25 alkoxy radicals may be bonded together, and additionally, in the case that
M = Al, R may be identical or different monovalent alkyl radicals, in which
case a plurality of alkyl radicals may be bonded together or one or more
alkyl radicals may be bonded to one or more of the abovementioned alkoxy
radicals,
- 30 n: valency of M.
2. The system according to claim 1, wherein R, in the case of an alkoxy radical, is
35 methoxy, ethoxy, 1-propoxy, 2-propoxy, 1-n-butoxy, 2-n-butoxy, 1-isobutoxy or 2-
isobutoxy.
3. The system according to claim 1, wherein R, in the case of an alkyl radical, is
methyl, ethyl, 1-propyl, 2-propyl, 1-n-butyl, 2-n-butyl, 1-isobutyl or 2-isobutyl.

4. The system according to claim 1 or 2, wherein compound d) is a titanium tetraalkoxide.
5. The system according to claim 1 or 2, wherein compound d) is an aluminum trialkoxide.
6. The system according to claim 1 or 3, wherein compound d) is a trialkylaluminum.
7. The system according to any of claims 1 to 6, wherein the R radicals in compound d) are the same.
8. A process for hydrocyanating an olefinically unsaturated compound in the presence of an Ni(0)-comprising catalyst system, which comprises using a system according to any of claims 1 to 7 as the Ni(0)-comprising catalyst system.
9. The process according to claim 8, wherein the olefinically unsaturated compound comprises a functional group selected from the group consisting of -CN, -COOR¹, -CONR²R³
- where R¹, R², R³: each independently, in the case that R² and R³ are the same or different, H or alkyl.
10. The process according to claim 8, wherein the olefinically unsaturated compound used is a compound of the formula (C₄H₇)-X
- where X: functional group selected from the group consisting of -CN, -COOR¹, -CONR²R³
- where R¹, R², R³: each independently, in the case that R² and R³ are the same or different, H or alkyl.
11. The process according to claim 8, wherein the olefinically unsaturated compound used is a linear pentenenitrile.
12. The process according to 8, wherein the olefinically unsaturated compound used is 3-pentenenitrile or 4-pentenenitrile.